

# **Endcap ring layouts with larger pixel chips**

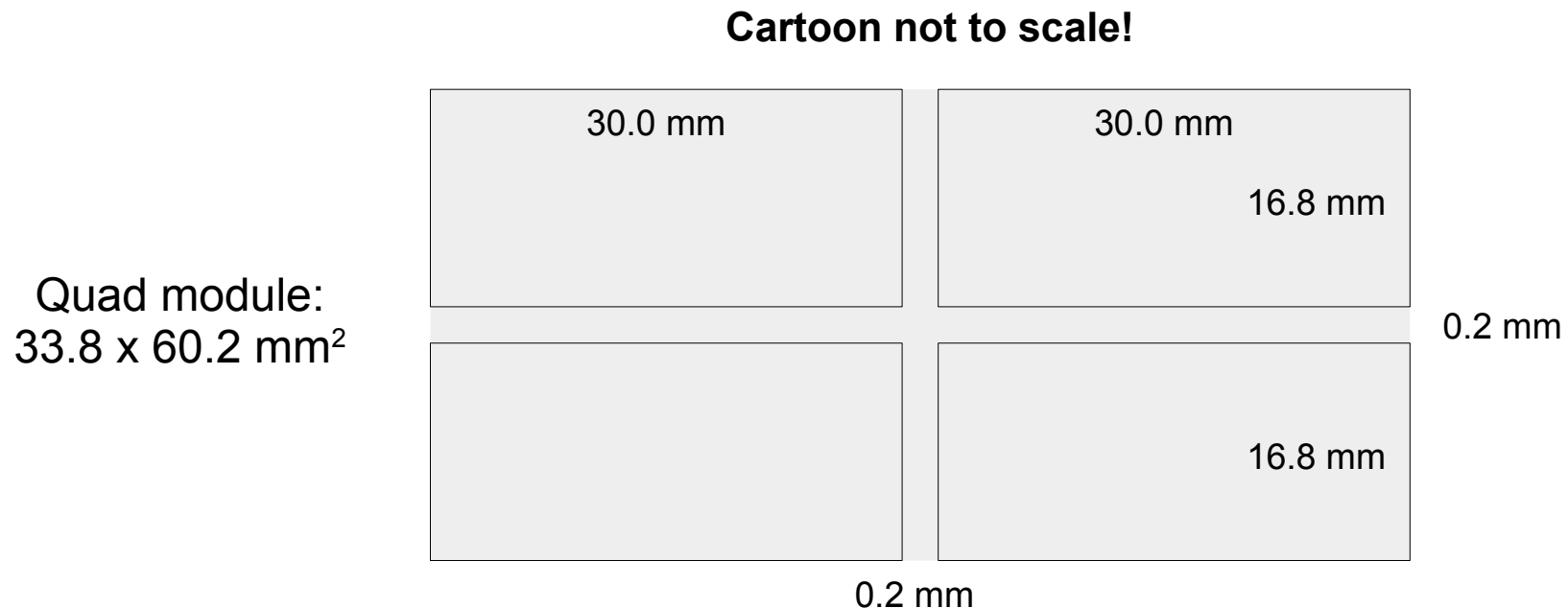
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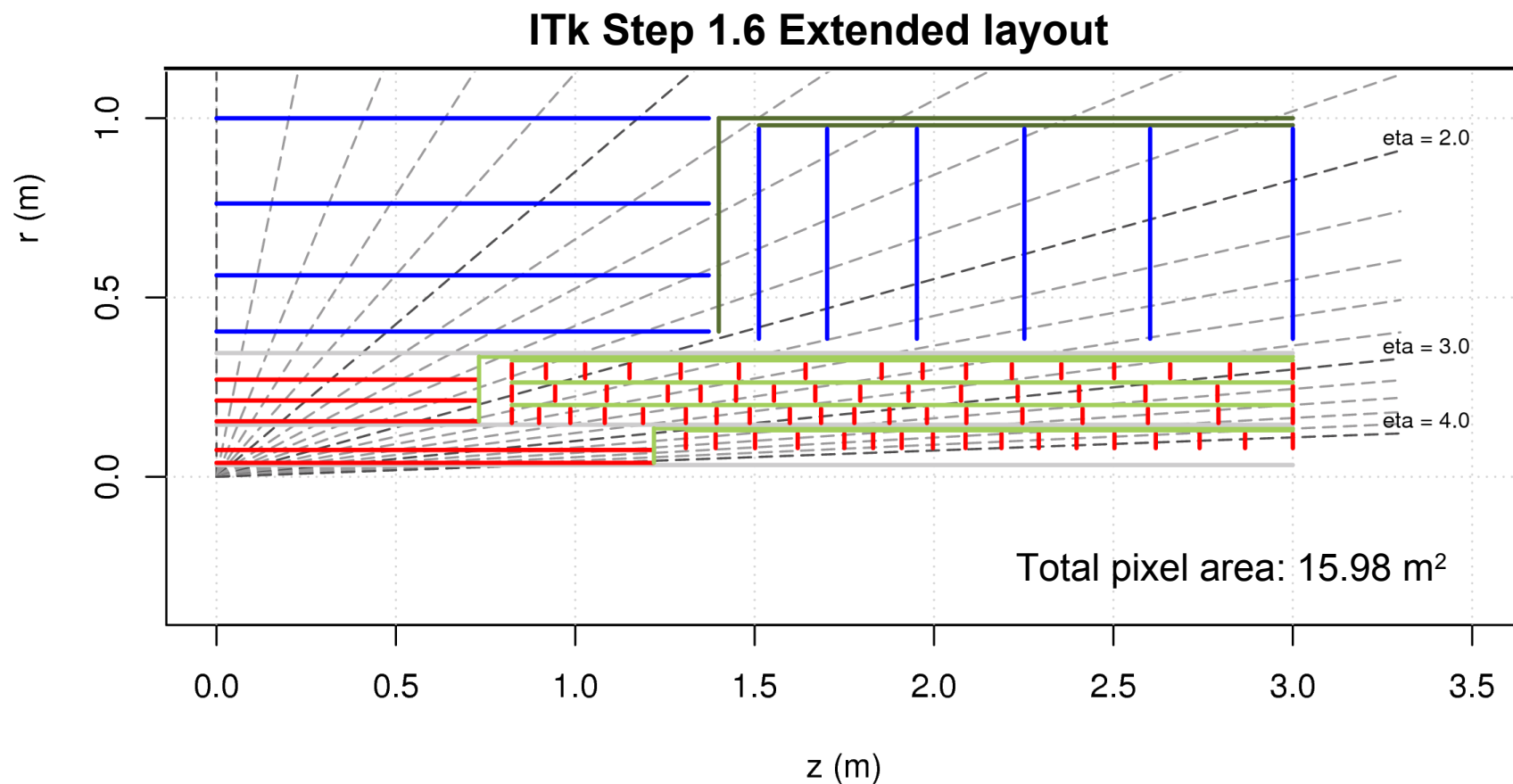
# Introduction: Larger ITk pixel chip

- Now is a good time to investigate the idea of a **larger pixel chip** for ITk
  - So far we have assumed IBL chip dimensions, but larger dimensions might be better to reduce the number of modules needed, and optimize use of readout cables
- These are first exploratory layouts with larger pixel chips
  - Single chips:  $16.8 \times 20.0 \text{ mm}^2 \rightarrow 16.8 \times \mathbf{30.0} \text{ mm}^2$
  - Active gap between chips in a same module: 0.2 mm



# Reminder: ITk Step 1.6 Extended layout

- Extended layout with 9 space-points minimum for  $|\eta| < 4.0$ ,  $|z_0| < 15$  cm
  - Endcap re-optimization with larger pixel chips easier to try in Extended layout
  - Inclined layouts would also require re-optimization in the forward barrel
    - Possible but more effort needed

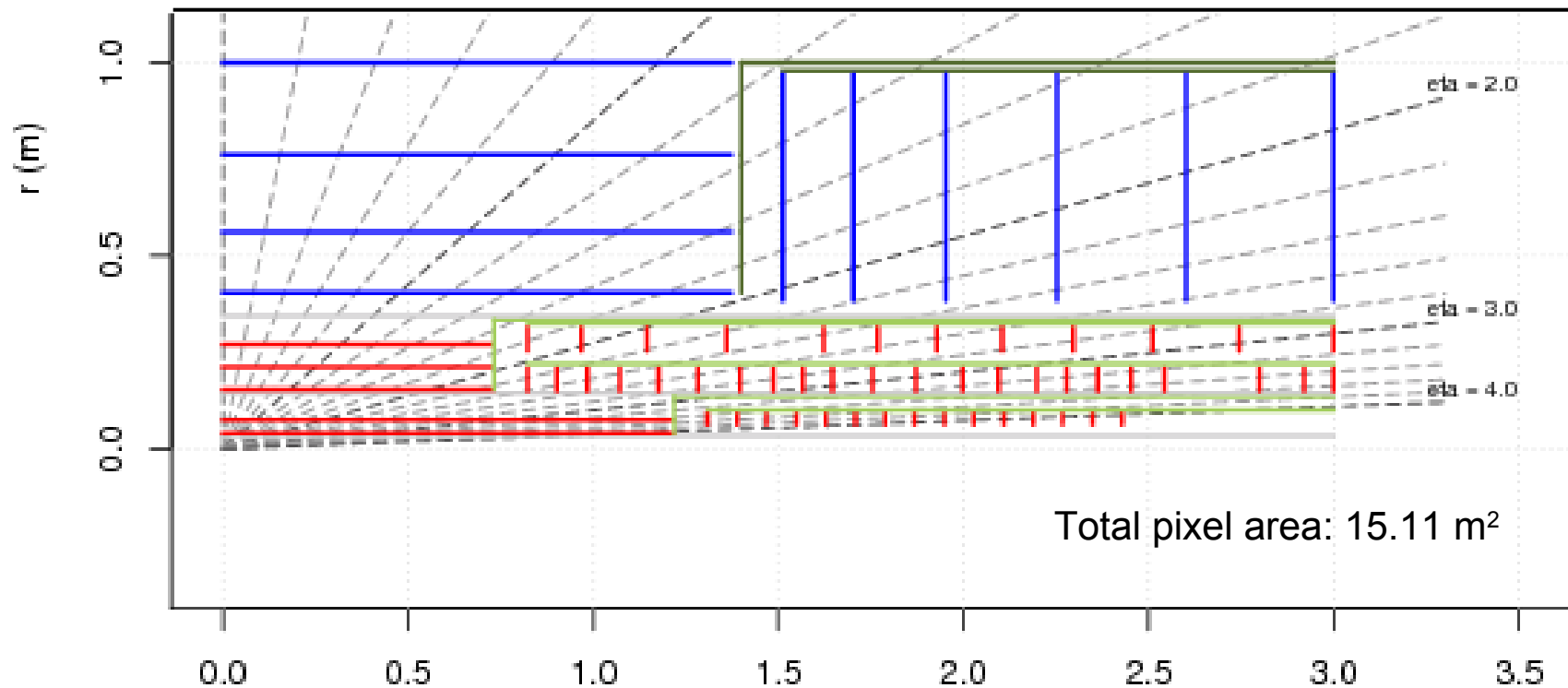


\* still counting long clusters as 1 space-point

# Example layout with a larger pixel chip

- Attempt extended layout with 9 space-points minimum for  $|\eta| < 4.0$ ,  $|z_0| < 15$  cm
  - Target the same number of space-points as in Step 1.6, for a more direct comparison
    - Pixel endcap designs with fewer hits are a possibility
  - One fewer outer ring layer, with quad modules; inner ring layer with single-chip modules

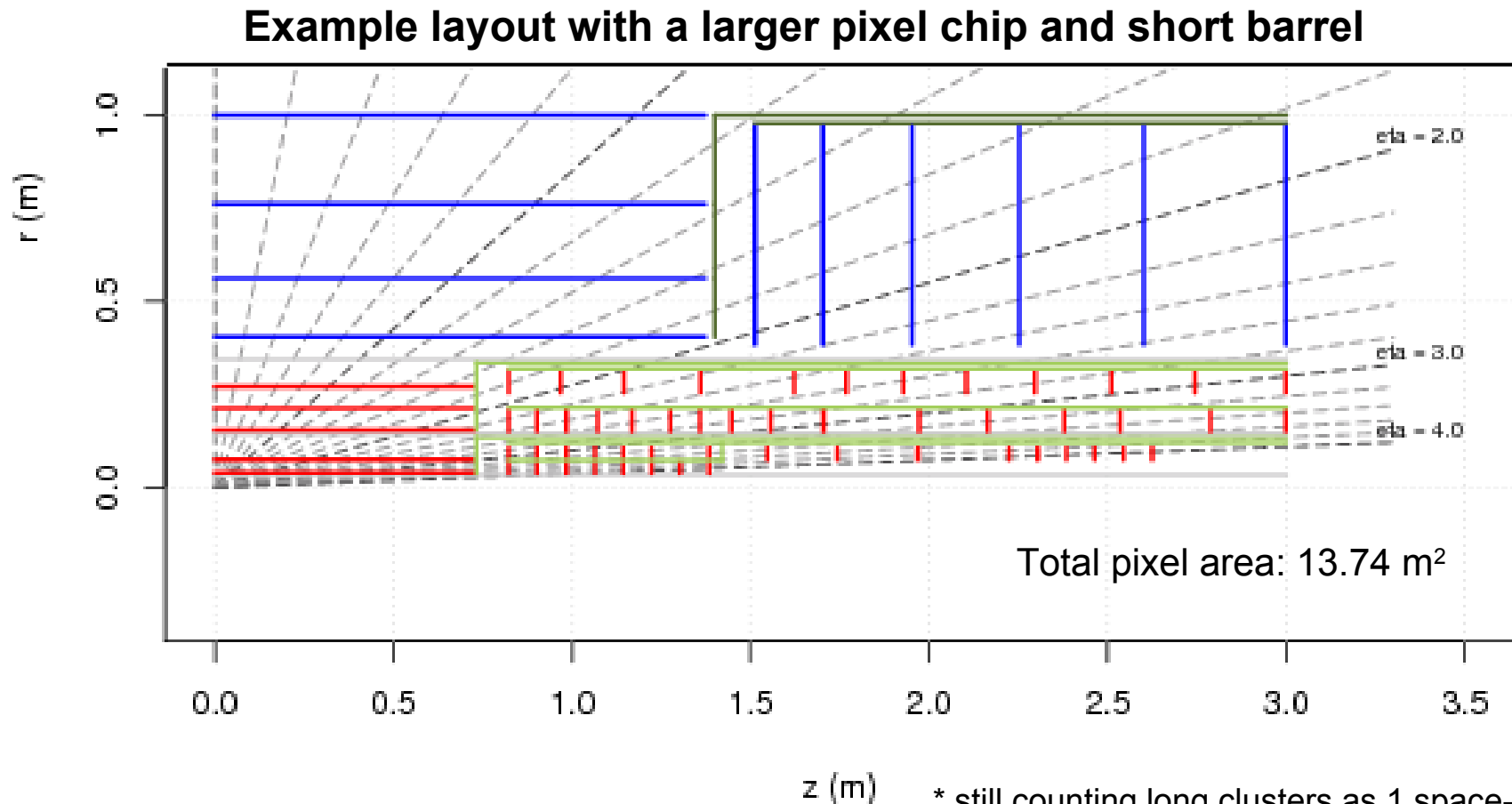
Example layout with a larger pixel chip



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# Example layout with a larger pixel chip and short barrel

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